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EXAMINER SAWHNEY, HARGOBIND S				
ART UNIT		PAPER NUMBER		
2875				

DATE MAILED: 08/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/989,273

Applicant(s)

HANSON ET AL.

Examiner

Hargobind S. Sawhney

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 June 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 6-19, 22 and 24-27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-19, 22 and 24-27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. The amendment and reply under 37 CFR 1.111 filed on June 8, 2005 has been entered.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1, 2, 4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Baur et al. (U.S. Patent No. 4,142,781).

Regarding claim 1, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

- a light source system including a light source 40 providing light not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 43-45);
- a reflective layer- combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the reflecting layer 50,30 (Figure 3, column 3, lines 5-7 and 11-20);

- the reflective layer 50,30 reflecting invisible light from the light source 40, and converting invisible light into light visible to human eyes (Figure 3, column 3, lines 5-7 and 11-20);
- a display layer having pixels alterable with application of electrical charge – interpreted as a liquid crystal display –LCD- (not shown, column 1, lines 17-20) well known in the art, and as evidenced by Baur et al. ('781);
- the display layer being illuminated by visible light from the reflective layer 50,30 (not shown, column 1, lines 17-20);
- the light source 40 located below the display layer – the lighting system operating as a back light source not shown, column 1, lines 17-20);

However, regarding Claim 1, Chen ('092) does not disclose a light source including a reflective layer having a phosphorescent.

On the other hand, Baur et al. ('781) discloses an electro-optical display device (Figure 9) comprising a fluorescent plate 1a including a phosphorescent coating - a layer 25 containing phosphorescent particles has been broadly interpreted as coating- (Figure 9, column 9, lines 5-10).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing the phosphorescent coating as taught by Baur et al. ('781) for the benefits and advantages of amplifying the

brightness of the display device, and for providing afterglow of the display after the device in switched-off.

Regarding claims 2, 4 and 7-9, Chen ('092) in view Baur et al. ('781) discloses the lighting system (Figure 3) further including;

- a light guide 10 (Chen, Figure 3, column 2, line 54);
- the light source 40 being a single light source, and being a light emitting diode (LED) 40 (Chen, Figure 3, column 3, lines 11-13);
- the reflective layer 50,30 including fluorescent coating 50 (Chen, Figure 3, column 3, lines 5-7 and 11-20) on a substrate;
- the light source providing an ultraviolet (UV) light (Chen, Figure 3, column 1, lines 9-12, and column 3, lines 34-38);—

Regarding Claim 6, Chen ('092) discloses a lighting system including a reflective layer on a substrate. However, Chen ('092) does not specifically teach the reflective layer including metallic coating. It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing a reflective surface (aluminum mirror surface) with metallic coating as evidenced by Baur et al. ('781) in Claim 8.

4. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Baur et al. (U.S. Patent No. 4,142,781) as applied to claim 1 above, and further in view of Vossler (U.S. Patent No. 5,856,819).

Chen ('092) in view of Baur et al. ('781) teaches a light source 40 providing light having wavelength in a spectrum not visible to the human eyes (Figure 3, column 1,

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lines 10-14, and column 3, lines 10-14). However, neither combined nor individual teaching of Chen ('092) and Baur ('781) specifically teaches the light source providing infrared (IR) light.

On the other hand, Vossler ('819) discloses a bi-directional presentation display 10 (Figures 1 and 2) illuminated with an IR light source – alternate to the light tube 70- (Figure 2, column 5, lines 44 and 49-57).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view of Baur ('781) by providing the IR-based lighting system as taught by Vossler ("819) for the benefits of making it usable in dark or at night with night vision equipment.

5. Claims 10 and 13-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Vossler (U.S. Patent No. 5,856,819) and Yamashita (US Patent No.: 4,599,537).

Regarding Claim 10, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

- a light source system including a light source 40 providing light not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 43-45);
- a reflective layer- combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the reflecting layer 50,30 (Figure 3, column 3, lines 5-7 and 11-20);

- the reflective layer 50,30 reflecting invisible light from the light source 40, and converting the invisible light into light visible to human eyes (Figure 3, column 3, lines 5-7 and 11-20);
- a display layer having pixels alterable with application of electrical charge – interpreted as a liquid crystal display (LCD) (not shown, column 1, lines 17-20) as taught by Baur et al. ('781);
- the display layer being illuminated by visible light from the reflective layer 50,30 (not shown, column 1, lines 17-20);

However, Chen ('092) does not specifically teach a display layer being illuminated by infrared light. Instead, Chen ('092) makes the use of ultraviolet light source for illumination of the display layer.

On the other hand, Vossler ('819) discloses a bi-directional presentation display 10 (Figures 1 and 2) illuminated with an IR light source – alternate to the light tube 70- (Figure 2, column 5, lines 44 and 49-57).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) by providing the IR-based lighting system as taught by Vossler ('819) for the benefits of making it usable in dark or at night.

Further, It would be have been obvious to one of ordinary skill in the art at the time of the invention to meet the method limitations of Claim 10 by applying the teaching of Chen ('092) in view Vossler ('819).

Regarding claims 13-15 Chen ('092) in view of Vossler ('819) discloses a lighting system further including:

- the light source being positioned behind the display element (not shown, Chen, column 1, lines 17-20);
- the reflective layer including metallic (aluminum mirror surface) surface well known in the art, and as evidenced in claim 8 of Baur et al. ('781);
- the display element being an LCD (Chen, not shown, column 1, lines 17-19);

Regarding claim 16, neither combined nor individual teaching of Chen ('092) and Vossler ('819) teach lighting system illuminating electronic paper(e-paper) displays.

It has been held that a recitation with respect to the manner in which a claim apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitation.

Further, It would be have been obvious to one of ordinary skill in the art at the time of the invention to meet the method limitations of Claims 13-16 by applying the teaching of Chen ('092) in view Vossler ('819).

6. Claims 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Vossler (U.S. Patent No. 5,856,819) as applied to Claim 10 above, and further in view of Yamashita (US Patent No.: 4,599,537).

Regarding Claim 11, Chen ('092) in view of Vossler ('819) discloses a lighting system including a source of light. However, neither combined nor individual teaching of

Chen ('092) and Vossler ('819) specifically discloses the light source being a light emitting diode (LED).

On the other hand, use of LEDs for visible as well as infrared light as taught by Yamashita ('537) for its compactness, long operational life and high-energy efficiency.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) by providing the LED as light source well known in the art for the benefits its compactness, long operational life and high-energy efficiency.

Further, It would be have been obvious to one of ordinary skill in the art at the time of the invention to meet the method limitations of Claim 11 by applying the teaching of Chen ('092) in view Vossler ('819) and Yamashita ('537).

7. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Vossler (U.S. Patent No. 5,856,819) as applied to Claim 10 above, and further in view of Lueder (US Patent No.: 6,559,918 B1).

Regarding Claim 12, Chen ('092) in view of Vossler ('819) discloses a lighting system including an LCD with a display element. However, neither combined nor individual teaching of Chen ('092) and Vossler ('819) specifically discloses the display element being flexible.

On the other hand, use of flexible liquid crystal display is well known in the art as evidenced in Lueder ('918 B1) discloses a flexible liquid crystal display (Figure 1, column 2, lines 20-22).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view of Vossler ('819) by providing the Flexible LCD as taught by Lueder ('918 B1) for the benefits of improved mechanical stability and displaying massages in multi-dimensional frame.

Further, It would be have been obvious to one of ordinary skill in the art at the time of the invention to meet the method limitations of Claim 12 by applying the teaching of Chen ('092) in view Vossler ('819) and Yamashita ('537) and Lueder ('918 B1).

8. Claims 17-19, 22 and 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen (U.S. Patent No. 5,982,092) in view Baur et al. (U.S. Patent No. 4,142,781) and Kim et al. (US Patent No.: 6,204,902 B1).

Regarding claim 17, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

- a light source 40 providing light not visible to the human eyes (Figure 3, column 1, lines 10-14, and column 3, lines 43-45);
- a light guide 10 dispersing the invisible light over a defined area (Figure 3, column 2, lines 56-62);
- a converter 50,30 – the combination of the reflective layer 30 and the combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the converter 50,30 (Figure 3, column 3, lines 5-7 and 11-20); and
- the converter 50,30 converting invisible light from the light source 40 into light visible to human eyes (Figure 3, column 3, lines 5-7 and 11-20).

Chen ('092) discloses a lighting system including a reflective layer on a substrate. However, Chen ('092) does not specifically teach the reflective layer including metallic coating. Further, Chen ('092) does not disclose a light source including a reflective layer having a phosphorescent.

On the other hand, Baur et al. ('781) discloses an electro-optical display device (Figure 9) comprising:

- a reflect plate including metallic mirrored coating (Figure 9, claim 8); and
- a fluorescent plate 1a, and an additional phosphorescent coating - a layer 25 containing phosphorescent particles- (Figure 9, column 9, lines 5-10).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing a reflective surface (aluminum mirror surface) with metallic coating well known in the art to reflect light for display illumination.

Further, it would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing the phosphorescent coating as taught by Baur et al. ('781) for the benefits and advantages of amplifying the brightness of the display device, and for providing afterglow of the display after the device in switched-off.

In addition, Chen ('092) discloses an LED planar light system usable as a light source for a liquid crystal display (Figure 3, column 1, lines 17-19). However, Chen('092) does not specifically teach the LED planar light system combined with a flexible display receiving and transmitting visible light.

On the other hand, Kim et al (' 902 B1) discloses flexible plate LCD device (Figure 1) receiving and transmitting visible light (Figure 1, column 2, lines 1-6).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view Baur et al. ('781) by providing the flexible display layer as taught by Kim et al (' 902 B1) for the benefits and advantages illuminating displays on non-planar surfaces.

Regarding claims 19,22, 24, 26 and 27, Chen ('092) in view Baur et al. ('781) and Kim et al (' 902 B1) discloses the display system further comprising:

- the flexible display (Kim, Figure 1) positionable over the light guide 10 (Chen, Figure 3, column 2, lines 56-61);
- a converter 50,30 – the combination of the reflective layer 30 and the combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the converter 50,30 (Chen, Figure 3, column 3, lines 5-7 and 11-20);
- the light source 40 including a light emitting diode (LED) (Chen, Figure 3, column 3, line 39, claim 2);
- the light source providing an ultraviolet (UV) light (Chen, Figure 3, column 1, lines 9-12, and column 3, lines 34-38); and
- the light source 40 combining with the light guide 10 to form a front lighting system (Chen, Figure 3, column 1, lines 17-19).

Regarding claims 18 and 25, Chen ('092) in view Baur et al. ('781) and Kim et al (' 902 B1) discloses the display system further comprising:

However, regarding claims 18 and 25, neither combined nor individual teaching Chen ('092) and ('781) teaches the display system having a back lighting system including a flexible display layer overlaying the light guide. On the other hand, Chen ('092) teaches a front lighting system having a light guide overlaying the flexible display layer.

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the display system of Chen ('092) by positioning the flexible display layer overlaying the light guide, since it has been held that rearranging parts of an invention involves only routine skill in the art.

Response to Amendment

9. Applicant's arguments filed on Jun 8, 2005 with respect to the 35 U.S.C. 103(a) rejections of claims 1-27 have been fully considered but they are not persuasive.

Argument: Regarding the amended Claim 1, neither Chen ('092) by nor Baur et al. ('781) teaches or suggests a reflective layer having phosphorescent surface.

Response: As detailed in section 3 of this office action, Chen ('092) discloses a lighting system for a display (Figure 3) comprising:

- a reflective layer- combination of the fluorescent pigment layer 50 optically in contact with the reflecting layer 30- herein after referred as the reflecting layer 50,30 (Figure 3, column 3, lines 5-7 and 11-20);

The fluorescent pigment layer 50 has been broadly interrelated as a coating when the layer is in optical contact with the reflection layer 30 (Chen).

Argument: Regarding the amended Claim 1, Chen ('092) teaches an LED planar light source including a separate fluorescent pigment layer 50 interposed between the light-conductive plate 10 and the light-reflective plate 30 (Chen, col. 2, lines 66 and 67; and col. 3, line 3). As elements 30 and 50 are two separate components, the fluorescent pigment layer 50 is also considered as a separate element.

Response: The phrase "interpose" has been interpreted as the phrase indicating relative positioning of any element. Chen ('092) teaches the relative position of the fluorescent pigment layer, which has been broadly, interpreted as coating – thin layer -.

Argument: Regarding the amended Claim 1, Chen ('092) does not teach a reflective layer having phosphorescent coated surface that both reflect the invisible light, and convert the invisible light into visible light.

Response: As detailed in section 3 of this office action, Chen ('092) teaches a fluorescent pigment layer 50 - broadly interrelated as a coating, as the layer 50 is in optical contact with the reflective layer 30.

Further, It would be have been obvious to one of ordinary skill in the art at the time of the invention to make the fluorescent pigment layer integral with the reflective layer, since it has been held that forming in one piece an article which has formerly been formed in two pieces and put together is a merely a matter obvious engineering choice, and involves only routine skill in the art.

Argument: Regarding the amended Claim 1, Baur et al. ('781) discloses an electro-optical display device (Figure 9) comprising a fluorescent plate 1a, and an additional phosphorescent coating - a layer 25 containing phosphorescent particles- (Figure 9, column 9, lines 5-10).

The above-indicated teaching does not teach the fluorescent plate, with an additional phosphorescent coating, being a reflective plate.

Response: As detailed in section 3 of this office action, please note the following:

Regarding Claim 1, Chen ('092) a light source including a reflective plate 30 in combination with a fluorescent pigment layer 50. However, Chen ('092) does not disclose a light source including a reflective layer having phosphorescent pigments.

On the other hand, Baur et al. ('781) discloses an electro-optical display device (Figure 9) comprising a fluorescent plate 1a,

and an additional phosphorescent coating - a layer 25 containing phosphorescent particles- (Figure 9, column 9, lines 5-10).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to modify the lighting system of Chen ('092) by providing the phosphorescent coating as taught by Baur et al. ('781) for the benefits and advantages of amplifying the brightness of the display device, and for providing afterglow of the display after the device in switched-off.

As detailed above, Baur et al ('781) teaches that an additional phosphorescent coating applied on a fluorescent plate 1a. Thus, teaching of Baur et al. ('781) could be provided on the reflective coating of Chen ('092). Further, the motivation for the above-indicated modification includes amplification of brightness of the display device

The test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. Thus, based on the teaching of Baur, one of ordinary skill in the art at the time of the invention would have been motivated to modify the device of

Chen for efficient conversion of invisible light to visible light, and for producing afterglow of the device.

Argument: Chen provides motivation not to use a single layer because of inherent disadvantages of using a single layer.

Response: The above-indicated conclusion has not been found in either Chen ('092) or Baur et al. (781).

Argument: Regarding claims 10-16, neither in combination or individually Chen ('092) and Vossler ('819) teaches conversion of infrared light into visible light.

Response: Vossler ('819) discloses a bi-directional presentation display 10 (Figures 1 and 2) illuminated with an IR light source – alternate to the light tube 70- (Figure 2, column 5, lines 44 and 49-57).

It would be have been obvious to one of ordinary skill in the art at the time of the invention to further modify the lighting system of Chen ('092) in view of Baur ('781) by providing the IR-based lighting system as taught by Vossler ('819) for the benefits of making it usable in dark or at night with night vision equipment.

Regarding Claims 17-19, 22 and 24-27, the above-indicated responses presented for the Claim 1 are equally applicable.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Hargobind S. Sawhney whose telephone number is 571 272 2380. The examiner can normally be reached on 6:15 - 2:45.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on 571 272 2378. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should


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you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

HSS
8/9/2005


Stephen Husar
Primary Examiner